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TOWNSEND and TOWNSEND and CREW LLP

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of:

Raymond Wellman, et al.

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For: SLIP COLLAR

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Examiner: Alicia Ann Chevalier

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APPELLANTS' BRIEF UNDER
37 CFR § 41.37

Mail Stop Appeal Brief
Commissioner for Patents
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Commissioner:

This Appellants' Brief is responsive to the Final Office Action mailed on December 8, 2009. Further to the Notice of Appeal submitted on May 7, 2010 for the above-referenced application, Appellants submit this Brief on Appeal pursuant to 37 C.F.R. 41.37.

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1. REAL PARTY IN INTEREST

The real party in interest of the subject patent application is ATS Products, Inc., the assignee of the present application.

2. RELATED APPEALS AND INTERFERENCES

None.

3. STATUS OF CLAIMS

Claims 15, 28, 31-34, 36-54 and 57-61 are pending and finally rejected. Appellants appeal from the rejection of all pending claims.

4. STATUS OF AMENDMENTS

An Amendment After Final was filed with the United States Patent and Trademark Office on May 7, 2010. In the Amendment, claim 62 was canceled to reduce the number of issues on appeal. The Amendment was entered for the purposes of this appeal in the Advisory Action dated May 27, 2010.

5. SUMMARY OF CLAIMED SUBJECT MATTER

In the following summary, Appellants have provided exemplary references to sections of the specification and drawings supporting the subject matter defined in the claims as required by 37 C.F.R. § 41.37. The specification and drawings also include additional support for other exemplary embodiments encompassed by the claimed subject matter. Thus, these references are only intended to be illustrative and not restrictive.

In industries that use corrosive and hazardous chemicals, vapors from hazardous chemicals must be exhausted through leak-proof vapor ducts. These duct installations can consist of many thousands of feet of ductwork, which are connected by numerous joints. A leak-proof joint is required between each section of ductwork. The joint must remain leak proof after prolonged exposure to corrosive and hazardous chemicals and must not catastrophically fail in the event of heat or fire from inside or outside the ductwork. Installation of these duct systems is

both expensive and time-consuming because the systems can be very large and contain numerous joints. Therefore duct joints that can be assembled more efficiently and cost-effectively are desired.

Embodiments of the invention include a duct assembly comprising a slip collar and sections that can be joined quickly and accurately, without the need for extensive aligning of the duct sections. In this manner, slip collars according to embodiments of the invention can be used to “self-align” two adjacent duct sections. The joint that is formed between connected duct sections is strong and has fire and chemical resistance, and provides for better joint strength and for a better barrier for fumes. By using the slip collars according to embodiments of the invention, ductwork can be installed quickly and accurately, and the duct network that is formed will be strong and reliable.

Some of the embodiments of the invention may be illustrated by the various independent and dependent claims described below.

Independent claim 15

Claim 15 is directed to a duct assembly comprising a slip collar, a first duct, and a second duct (paragraph [0023], lines 15-16). The slip collar comprises a tubular outer wall portion, a tubular inner wall portion, and an intermediate portion disposed between the tubular outer wall portion and the tubular inner wall portion (paragraph [0024], lines 21-24), which form an integral, one-piece structure (paragraph [0042], lines 25-27) made of a fiber reinforced plastic material (paragraph [0025], lines 28-32). The slip collar further comprises a first slot region defined by the tubular outer wall portion and the tubular inner wall portion, and a second slot region defined by the tubular outer wall portion and the tubular inner wall portion (paragraph [0024], lines 25-27), and the first and second slot regions face away from each other (paragraph [0042], lines 27-29). The tubular wall outer portion includes a curved section including apertures with set screws which are disposed in the apertures (paragraph [0032], lines 24-26). The first duct including a first end is inserted into the first slot region, and the second duct including a second end is inserted into the second slot region (paragraph [0032], lines 29-30). The first and second ducts also comprise a fiber reinforced plastic material and have a constant diameter (paragraph [0046], line 27).

Independent claim 36

Claim 36 is directed to a duct assembly comprising a slip collar and a duct (paragraph [0059]). The slip collar comprises a tubular outer wall portion, a tubular inner wall portion, and an intermediate portion disposed between the tubular outer wall portion and the tubular inner wall portion (paragraph [0059], lines 5-6). Each of the tubular outer wall portion, the tubular inner wall portion, and the intermediate portion all comprise a fiber reinforced plastic material (paragraph [0059], lines 12-13), and form an integral one-piece structure (paragraph [0042], lines 25-27). The slip collar further comprises a slot region defined by the tubular outer wall portion and the tubular inner wall portion (paragraph [0059], lines 7-9). The tubular outer portion includes a curved section comprising apertures with set screws which are disposed in the apertures (paragraph [0032], lines 24-26). The duct comprises a first end section, made of a fiber reinforced plastic material and having a constant diameter that is inserted into the slot region (paragraph [0046], line 27). The set screws contact the first end section of the duct to secure the first end section of the duct to the slip collar (paragraph [0060], lines 17-21).

Dependent claim 40

Claim 40 depends from claim 36 and additionally recites: "...wherein the tubular inner wall portion comprises a fluoropolymer material." (paragraph [0038], lines 29-31).

Dependent claim 45

Claim 45 depends from claim 36 and additionally recites: "...wherein the fiber reinforced plastic material comprises chopped strand mat." (paragraph [0050], lines 14-16).

Dependent claim 61

Claim 61 depends from claim 15 and additionally recites: "...wherein the apertures are only in the curved section." (paragraphs [0032] and [0060]; Fig. 1).

6. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

A. 35 U.S.C. 112, 1st paragraph

In the final Office Action mailed on December 8, 2009, on pages 2 and 3, claim 61 is rejected under 35 U.S.C. § 112, first paragraph, as allegedly containing new matter.

B. 35 U.S.C. 103

In the final Office Action mailed on December 8, 2009, claims 15, 28, 31-34, 47-51, 53-56, 58, 60 and 61 are rejected under 35 U.S.C. § 103 as being unpatentable over van Vliet (USPN 4,099,749) in view of Shea (USPN 5,383,994) and Williams, *et al.* (USPN 5,961,154).

C. Claims separately argued on appeal

For purposes of this Appeal, Appellants would like to separately argue the patentability of independent claims 15 and 36 and dependent claims 40, 45, and 61. Claims 28, 31-34, 47-51, 53-54, and 58 may stand or fall with respect to claim 15. Claims 37-46, 52, 57, and 59-60 may stand or fall with respect to claim 36. No admissions are made by the groupings of claims, and Appellants reserve the right to pursue features in any of the claims in continuation applications.

7. ARGUMENT

A. Dependent claim 61

In the Office Action, claim 61 is rejected under 35 U.S.C. § 112, first paragraph, as allegedly containing new matter. Applicant respectfully disagrees.

1. Claim 61 does not contain new matter.

Claim 61 recites: “The duct assembly of claim 15 wherein the apertures are only in the curved section.” The Office Action alleges that claim 61 was not described in the specification in such a way as to reasonably convey to one skilled in the art, at the time of the invention, that Applicants were in possession of the claimed invention.

Applicant’s respectfully disagree. Paragraphs [0032] and [0060] and Figures 1 and 7 clearly disclose set screws that are located only in the curved section. Specifically, paragraph 32 states:

A plurality of set screws 34 may optionally secure the end portion 32 of the duct section 30 to the slip collar 10,100. As shown in FIG. 1, the formed joint is strong and leakproof. The set screws 34 are useful when the adhesive sealant compositions are curing. For example, an adhesive composition that is produced from a material such as ChemBond™

Figure 1 illustrates an embodiment where set screws are only in the curved section:



Cone shaped set-screws 306 (or other attachment elements) can be used to hold the duct section 308 in position until any adhesive that is present in the slot region at the first end 320 of the slip collar 310 cures. It is possible to start off with 3 set-screws for the smaller diameter duct sections. The number of set screws may be increased as the diameters increase.

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B. Independent claim 15

At page 3 of the Office Action, claim 15 is rejected under 35 U.S.C. §103(a) as being unpatentable over van Vliet in view of Shea and Williams. Obviousness has not been established for a number of reasons. Appellants will show that neither van Vliet nor Shea nor Williams alone or in combination teach or suggest each and every element of the above-noted claims.

- 1. Neither van Vliet nor Shea nor Williams teach or suggest, *inter alia*, “curved section including apertures” or “set screws are disposed in the apertures,” as recited in independent claim 15.**

Independent claim 15 recites the following limitation:

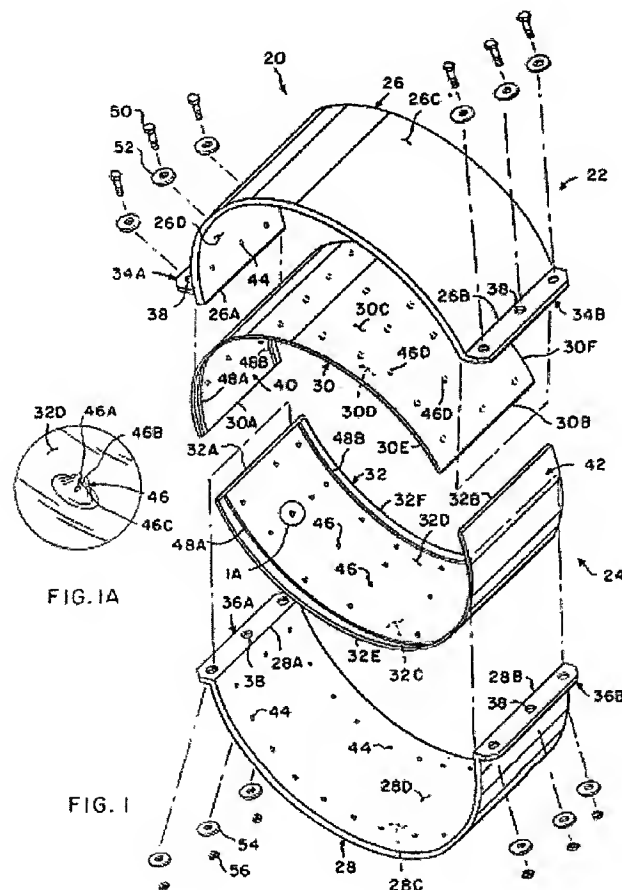
wherein the tubular wall outer portion includes a curved section including apertures, and wherein set screws are disposed in the apertures

The Office Action admits that neither van Vliet nor Shea teach or suggest these limitations. Office Action, pages 3-4. To supply these missing limitations and reject independent claim 15, the Examiner relies on Williams. Specifically, the Examiner alleges on page 4 of the Office Action that Williams teaches “that slip collars are formed with set screws and/or adhesive compositions applied in the slot regions comprised of novolac or epoxy resin (col. 4, l. 2-4) of the slip collar to provide additional connection strength between the ducts and the coupling device (reference 94, Figure 7 and reference 38, Figure 1).” Applicants respectfully submit that the passages and accompanying figures of Williams the Examiner cites do not in fact teach a tubular outer portion that includes apertures, and set screws that are disposed in the apertures, as recited in claim 15.

The passage of Williams cited by the Examiner (col. 4, l. 2-8) states:

The sealant includes a settable admixture of curing agent and novolac epoxy resin. The clamping means includes at least one arcuate clamp portion having a metal inner skin attached to a metal outer skin. The mechanical linkage means is a multiplicity of punched protrusions in each inner skin, with each protrusion having an apex in penetrating contact with one of the duct section end portions.

Nowhere in the above passage is there any mention of set screws. In fact, Williams describes a mechanical linkage means that is a multiplicity of punched protrusions in the inner skin of an arcuate clamp. Such a surface, as shown in Figure 1 as 32D, would prevent “the first [duct] end inserted into the first slot region and the second [duct] end inserted into the second slot region each have a constant diameter,” as recited in independent claim 15. The protrusions would prevent the ducts from being inserted into the slip collar to be secured by set screws. As such, Williams actually teaches away from the limitations of claim 15.



Additionally, Applicants respectfully submit that reference 38 in Figure 1, that the Examiner alleges teaches that slip collars are formed with set screws, is also in error. Specifically, Figure 1, reference 38, reproduced above, shows “three collinear bolt holes.” (See

Williams, column 7, lines 2-3). It is readily apparent that a hole is not a set screw. Furthermore, the description of the hole 38 as a **bolt hole** also inherently implies that fasteners intended for such holes are not set screws. In fact, the text of Williams confirms this inference in the description of reference 50 depicted in Figure 1. According to column 7, lines 39-44 of Williams, "Clamp portions 22 and 24 are connected by a bolt 50 passing through each hole 38 in the flanges 34A, 36A and 34B, 36B. Each bolt is secured by first and second washers 52, 54, and a nut 56 which can be tightened with an ordinary crescent or open-end wrench." As such, the fasteners are inherently and explicitly **not** set screws as alleged by the Examiner.

The Examiner asserts that the "apertures are only in the curved section via a flange." Office Action, page 4. The Examiner further asserts: "Applicant's claim language does not exclude the embodiment disclosed by Williams in which the screws are in apertures that are present in flat flanges, since the curved section of the tubular wall outer portion only has to include apertures. The apertures are located on the curved section via the flange portion. The fact that combination of references includes additional structure not required by Applicant's invention is irrelevant. The curved section includes apertures." Office Action, page 12.

The Examiner's assertion is in error. (See especially the underlined and italicized language above.) The alleged "cylindrical metal outer skin 26, 28" of Williams **do not include apertures** and **do not include set screws** disposed in the apertures. In fact, by the Examiner's own admission, the "collinear bolt holes" of Williams are in the "flange," not the alleged curved section. Indeed, Williams states: "Outer skin ends 26A, 26B, 28A, 28B extend radially in a flange 34A, 34B, 36A, 36B, respectively. Each flange has three collinear bolt-holes 38." Therefore, the "holes" of Williams are clearly not in the alleged curved section (i.e., the "cylindrical metal outer skin 26, 28"). Claim 15 expressly recites that the "tubular wall outer portion includes a curved section including apertures." This phrase – "wherein the tubular wall outer portion includes a curved section including apertures" – clearly indicates that the apertures are in a "curved section," not in any alleged "flange." As shown above, the "collinear bolt-holes 38" are **not** in the curved section of the "clamping collar 20."

Additionally, the Examiner's allegation that "Applicant's claim language does not exclude the embodiment disclosed by Williams in which the screws are in apertures that are

present in flat flanges, since the curved section of the tubular well outer portion only has to include apertures” (Office Action, page 12) is irrelevant because Williams does not disclose that the apertures are in the “curved section.” Again, this assertion also shows the Examiner is in error because the Examiner admits that the “apertures that are present in **flat** flanges” (Office Action, page 12), not the “curved section” as recited in claim 15.

For at least these reasons, claim 15, and all claims dependent therefrom, should be allowed.

2. Declarations providing evidence that the claimed invention is not obvious.

Applicants have also submitted additional evidence of non-obviousness in the form of previously filed 37 C.F.R. 1.132 Declarations of Jeff Shea, as filed on June 28, 2007 (“the First Shea Declaration”) and October 9, 2007 (“the Second Shea Declaration”), and Joe Plecnik, as filed on March 1, 2006 (“the Plecnik Declaration”). Even assuming, *arguendo*, that the Examiner can allege that the claims are obvious in view of the cited references, Applicants submit that the Declarations provide sufficient evidence to rebut any allegation of obviousness. In each of the Office Actions dated December 8, 2009 and March 25, 2009, the Examiner failed to even address the Shea and Plecnik Declarations as evidence of non-obviousness. The declarations sufficient to overcome any alleged *prima facie* case of obviousness because they provide evidence of (1) commercial success; (2) non-obvious advantages over the prior art, and (3) long felt need for the claimed invention.

i. Commercial Success

Commercial success of products falling within the claims of the patent that flow from the functions and advantages disclosed or inherent in the description in the specification is pertinent to the issue of non-obviousness. *In re Vamco Machine & Tool, Inc.*, 752 F.2d 1564, 224 USPQ 617 (Fed. Cir. 1985). It is clear that the commercial success is due to the many structural and economic advantages of the claimed invention. Specifically, the First and Second Declarations of Jeff Shea show the commercial success of a product embodying claimed features of the invention and provide a nexus between the success and the invention. According to MPEP § 716.03(b)IV, objective evidence must be provided showing specific commercial success with

relation to market evidence such as market share, time period during which sold, or what sales would normally be expected in the market. The First and Second Shea Declarations demonstrate that sales of ATS Products' H-Collar™ line of joint products made according to embodiments of the claimed invention have increased significantly since their introduction (First Shea Declaration, paragraph 4; and Second Shea Declaration, paragraph 6), and that the increase is not due to the ATS Products' dominant market share or extensive marketing efforts. (Second Shea Declaration, paragraph 4; First Shea Declaration, paragraph 7). Rather, the First and Second Shea Declarations show that increase in sales of the H-Collar™ line of joint products is due to the technical advantages and inventive features of the claimed invention. (Second Shea Declaration, paragraphs 5 and 7).

Specifically, the First Shea Declaration states the pending claims cover ATS Products' H-Collars™ line of joint products, and that "many of the features recited in the claims are responsible for the commercial success of the product." *Id.* ¶5. "[C]ustomer contractors have indicated that the ease and speed of installation and reliability of the resulting ductwork using the H-Collar™ joint products have allowed them to increase their productivity and profitability and that they are willing to pay a premium for such advantages." *Id.* More specifically, paragraph 4 of the First Shea Declaration shows the sales growth due to some of the claimed features of the embodiments in the H-Collar™ line of joint products:

Since 2003, ATS has sold more than 16,850 H-Collar™ so Sales have grown from about 367 units in 2003, to about 946 units in 2004, to about 5,921 units in 2005 and about 5,197 units in 2006. Approximately 4435 H-Collar™s have been sold in 2007 as of the date of this declaration. I believe that these sales are unexpectedly good in the duct industry.

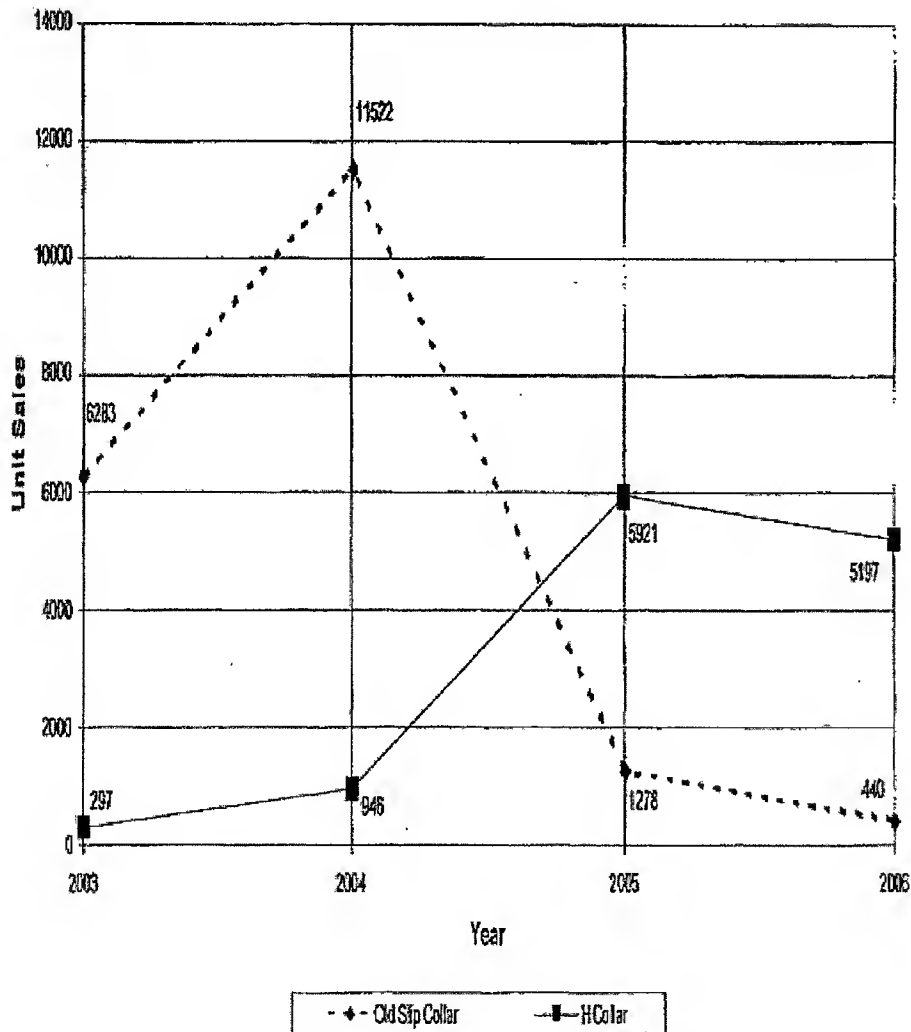
The Second Shea Declaration ties these gross sales figures to (1) the time period when the product was sold, (2) what sales would normally be expected, and (3) market share – even though MPEP 716.03(b)IV only requires one of these three alternatives. First, as to the time period when the sales were made, paragraph 6 states:

These sales accompany the sales of fiber reinforced duct and other products necessary to install duct assemblies in semiconductor and other facilities that require light weight, yet chemical and fire resistant exhaust

duct. This increase is in contrast to the decline in sales of ATS's old slip collar joint products, which represent a more traditional approach to duct joints. Between 2004 and 2006, sales of the old slip collar dropped from approximately 11,500 units annually to merely 440 units annually. (See Chart A).

Chart A of the Second Shea Declaration is reproduced below:

Comparison of H-Collar and Old Slip Collar Unit Sales
Chart A



Second, as to what sales would normally be expected (i.e., sales of products embodying the old technology), paragraph 7 of the Second Shea Declaration states:

ATS has experienced an increase in H-Collar™ sales despite the availability of more dominant and traditional joining methods, similar to ATS's old slip collar (an example of which is shown as element 60 in U.S. Patent No. 5,961,154), that use less expensive collars but require significantly more time and labor. I believe that this shows that consumers recognize that the H-Collar™ has technical advantages over ATS's old slip collar.

Third, as to market share, paragraph 4 of the Second Shea Declaration states:

I believe that ATS fiber reinforced plastic duct and joint products account for less than 10-20% of all sales to this market sector. I further believe that the other 80% - 90% of the market is occupied by approximately 20-30 other manufacturers who provide various types of coated metal ducts. I believe that ATS does not occupy a dominant market position in the fire safe duct market and that there are other options for fire safe joints and duct assemblies that are available.

Additionally, paragraph 7 of the First Shea Declaration provides evidence that the commercial success was due to the inventive features of the H-Collar™ joint products, not extensive marketing efforts:

I also do not believe that the commercial success of the H-Collar™ joint products is due to extensive marketing efforts on behalf of ATS, but was rather due to the claimed inventive features of the H-Collar™ joint products.

As such, Applicants have demonstrated that the claimed features of the invention, as embodied in the H-Collars™, are responsible for the commercial success and have rebutted any alleged *prima facie* case of obviousness.

ii. Advantages over the cited references

The Plecnik Declaration, as well as the First and Second Shea Declarations, provide evidence that the embodiments of the claimed invention provide for non-obvious structural differences from and economic advantages over the duct assembly of the prior art. Dr. Plecnik provides third party expert evidence of structural advantages of the claimed invention.

As evidenced by the Plecnik Declaration, embodiments of the invention provide for a number of non-obvious advantages over the prior art cited. These advantages include more efficient and less costly duct assembly procedures, as well as stronger joints. For example, in paragraphs 5-8, Dr. Plecnik states the following:

5. I believe that the slip collar that is described in the present application has a number of advantages. Some advantages are provided at paragraph [0027] of the present application. Paragraph [0027] states:

The slip collars according to embodiments of the invention are especially useful for joining ducts. As explained below, in preferred embodiments of the invention, an adhesive composition can be deposited in the first and second slot regions, and two sections of duct can be joined quickly and accurately, without the need for extensive aligning of the duct sections. Thus, slip collars according to embodiments of the invention can be used to “self-align” two adjacent duct sections. In addition, the joint that is formed between connected duct sections is strong and can have fire resistance and chemical resistance. The slip collars include both inner and outer wall portions. They provide [for better] joint strength and for a better barrier for fumes than slip collars that are made from only a single layer of material. For example, in order for a gas inside of a duct assembly to leak from the interior to the exterior, a gas would have to traverse through the two wall portions of the slip collar and the walls of the duct sections that are being joined. Also, by using the slip collars according to embodiments of the invention, ductwork can be installed quickly and accurately. A duct network that is formed using the slip collars according to embodiments of the invention will be strong and reliable. Although slip collars for ducts are described in detail, embodiments of the invention may be used to join other types of tubular articles such as two sections of pipe.

I believe that these advantages make the slip collar described in the present application better than the duct joint described in Williams. Further advantages of the slip collar described in the present application over the duct joint described in Williams are provided below.

6. I believe that it takes less time to assemble ducts using the slip collar described in the present application, than the duct joint described in Williams. To join two duct sections together in Williams, slip collar 60,

as shown in FIG. 4 of the Williams patent, is coated with an adhesive. As shown in FIG. 5 of the Williams patent, the duct sections are then joined to the adhesively coated slip collar 60. A sealant 84 is then coated on the joined duct sections. Once joined, outer clamp portions 22, 24 are assembled around the slip collar 60 using bolts 50 (see FIG. 5). It is apparent that the process described in Williams uses at least six separate process steps. Compared to the Williams process which uses at least six process steps to form a duct joint, the slip collar that is described in the present application can use three or four process steps to form a duct joint. The slip collar that is described in the present patent application is a one-piece structure. The one-piece structure has slot regions and these regions can be coated with an adhesive. Once surfaces of the slip collar defining the slot region are coated, the two duct sections are inserted into the slot regions. Optional set screws may be used to secure the slip collar to the joined duct sections. Thus, the slip collar that is described in the present application can be used to form a joint more quickly than the components described in Williams. Consequently, significant amounts of time, labor, and money can be saved using the slip collar that is described in the present application, as compared to the duct joint that is described in Williams.

7. The resulting duct joint that is formed when using the slip collar described in the present application is stronger than the duct joint that is formed in Williams. Duct joints are often the weakest points of any duct system, and it is desirable to make sure that these weak points are as strong as possible. The duct joint described in Williams has multiple parts including an inner slip collar 60 and outer clamp portions which are joined by bolts 50 and adhesive layers. The regions where these multiple parts are joined can potentially fail. In comparison, the slip collar that is described in the present application is a one-piece structure and does not have joining regions like those described in Williams. I believe that the slip collar that is described in the present application is stronger and is less prone to failure than the duct joint described in Williams.

8. In summary, I believe that the slip collar that is described in the present application is not shown or suggested by Williams, and that the slip collar that is described in the present application has a number of advantages over the duct joint that is described in Williams.

Additionally, the First and Second Shea Declaration also provide for a number of non-obvious advantages over the prior art cited, such as the efficiency gains by not having to

wrap the joint with external wrapping. Specifically, paragraphs 3 and 6 of the First Shea Declaration state:

The H-Collar™ line of joint products provide contiguous internal corrosion resistant liners and an alignment tool for joining corrosion and fire resistant duct and pipe in critical applications while also reducing installation time. Installation of duct or pipe work using the H-Collar™ joint products only requires application of an adhesive and inserting the duct into the collar. There is no need for additional external wrapping of the joint.

* * *

The H-Collar™ joint products are intended to provide a contiguous internal liner as well as a built-in alignment tool with no need for complicated processes or multi-part components to join two sections of duct. Prior to the introduction of H-Collar™ joint products, ATS offered its Internal Beaded Slip Collar™ joint products. Internal Beaded Slip Collar™ joint products are similar to structure 60 in FIG. 2 of the Williams patent assigned to ATS. (See Williams, United States patent number 5,961,154). Like the duct assembly in Williams, duct assemblies made with Internal Beaded Slip Collar™ joint products require multiple steps and separate external parts to ensure reliably sealed and structurally sound joints. As a result, installations of ducts using Internal Beaded Slip Collar™ joint products take considerably more time and are less reliable than installations of ducts using H-Collar Slip Collar™ joint products.

Paragraph 5 of the Second Shea Declaration continues:

The H-Collar™ was introduced in 2003 to allow contractors to install ATS duct without the need to do exterior wrapping of joints. Connecting joints in an expeditious and vapor-tight manner is of critical importance in semiconductor duct installations where cost and protection of personnel, processes and equipment are major concerns. Time and labor in ensuring a vapor-tight seal at each joint are major portions of the cost of duct installation. Use of the H-Collar™ in duct assemblies provides reliable joints that are easier and faster to install than other previous and contemporary techniques in such critical installations.

Accordingly, in view of the evidence of advantages of the claimed invention over the prior art provided in the Plecnik Declaration and the First and Second Shea Declarations, Applicants have rebutted any alleged *prima facie* case of obviousness.

iii. Long Felt Need

Finally, paragraph 7 of the First Shea Declaration provides evidence of a long felt need for duct joint products, such as H-Collar™ joint products, embodying the claimed invention:

I also believe that the H-Collar™ joint products helped to satisfy a long felt need. Previously, contractors had to spend much time fitting and joining ductwork with complicated multi-part and multi-step joint products which required careful and onerous alignment, fastening and sealing. Such extended installation procedures limited the amount of ductwork that installers could install on a given day, thus limiting their total annual job capacity. H-Collar™ joint products address this long felt need by allowing installers to more easily and quickly align, fasten and seal sections of ductwork in minutes.

Dr. Plecnik's declaration also supports the proposition that it "takes less time to assemble ducts using the slip collar described in the present application" than the slip collars in the prior art. Accordingly, in view of the evidence of long felt need of the claimed invention over the prior art provided in the Shea Declarations and the Plecnik Declaration, Applicants have rebutted any alleged *prima facie* case of obviousness.

3. Improper hindsight

Further, in addition to failing to teach or suggest all the claim limitations, the obviousness rejection must combine no less than three references (van Vliet, Shea, and Williams) to reject the invention of even the broadest claim. Applicants submit that the rejections of record are erroneous and rely on improper hindsight. See *KSR International Co. v. Teleflex Inc.*: 82 USPQ2d 1385 (2007) ("A factfinder should be aware, of course, of the distortion caused by hindsight bias and must be cautious of arguments reliant upon ex post reasoning."). Here, the Examiner used improper hindsight to van Vliet, Shea, and Williams. According to the Court of Appeals for the Federal Circuit:

“It is difficult but necessary that the decisionmaker forget what he or she has been taught . . . about the claimed invention and cast the mind back to the time the invention was made (often as here many years), to occupy the mind of one skilled in the art who is presented only with the references, and who is normally guided by the then-accepted wisdom in the art.” *W.L. Gore & Associates, Inc. v. Garlock, Inc.*, 721 F.2d 1540, 220 USPQ 303, 313 (Fed. Cir. 1983).

Here, one viewing only van Vliet, Shea, and Williams would not have combined them in the manner proposed by the Examiner absent improper hindsight.

van Vliet is entitled “Coupling Sleeve.” It describes a coupling member for coupling two sheet metal channels together for using in an air circulation of air conditioning system. See Abstract and Col. 1, lines 5-11.

Shea is entitled “Method for Making a Double Wall Fire Proof Duct.” It describes ductwork made out several layer of fire and corrosion resistant materials. See Abstract.

Williams is entitled “Fume Duct Joint With Claiming Collar.” It describes a internal sleeve, a clamp, and bolts used to join ductwork. See Abstract.

Clearly, one viewing only van Vliet, Shea, and Williams, would not have combined these references in the manner proposed by the Examiner, unless he had had the benefit of looking at Applicants’ specification first. For example, in rejecting claim 15, the Examiner essentially alleges that it would have been “obvious” for one to have: (1) looked to van Vliet, which describes a coupling sleeve for use in heating and air conditioning; (2) decided that the van Vliet’s coupling sleeve should be made of a “fiber reinforced material”; (3) extracted a teaching of “fiberglass reinforced plastic” from Shea, when Shea describes the composition of duct section, not duct joints; and (4) decided that the combination of van Vliet and Shea should be further modified by Williams, which describes a coupling system with a flange including bolt holes. As discussed above, even this tenuous combination of three references fails to teach or suggest all the claim limitations (i.e. “curved section including apertures” or “set screws are disposed in the apertures”) because the “bolt holes” of Williams are not in the curved section, rather the “bolt holes” are in the “flange.”

Moreover, the alleged combination of van Vliet, Shea, and Williams would have to ignore van Vliet's requirement that the "construction is simple" and that the "aim" of van Vliet's invention was to **avoid the use of "screw bolts, rivets, welded joints etc."** Col. 1, lines 5-16. One of skill in the art simply would not have modified van Vliet, as alleged in the Office Action. van Vliet uses a "sleeve" in conjunction with a "loose resilient strip having a plurality of upwardly and downwardly obliquely protruding teeth formed integrally from said strip." Abstract; Fig. 4. The sleeve and the strip have teeth that face in opposite directions and the "teeth ... engage and lock said duct element to said coupling sleeve." *Id.* van Vliet explicitly avoided using "screws" so that the coupling sleeve was more simple. Moreover, such a connection means would not be useful in an application where a leakproof connection is required (e.g., toxic and hazardous fumes, as opposed to the heating and air conditioning systems in van Vliet).

Clearly, this proposed sequence of events is illogical and would not have been "obvious" to a person of skill in the art at the time of the invention by looking only at van Vliet, Shea, and Williams, without looking at Applicants' disclosure. Rather, the proposed sequence of events could have only resulted from improper hindsight in view of Applicants' disclosure, picking and choosing isolated disclosures from the prior art to meet the claims without regard to what the prior art actually teaches or suggests.

The combination of references proposed by the Examiner would not have been made without looking at Applicants' disclosure first. Since the Examiner's proposed combination would not have been made without knowledge of Applicants' specification, the rejection is based improper hindsight.

C. Independent claim 36

In the Office Action, claim 36 is rejected under 35 U.S.C. §103(a) as being unpatentable over van Vliet in view of Shea, Williams, and Jacobson. Obviousness has not been established for a number of reasons. Appellants will show that neither van Vliet nor Shea nor Williams nor Jacobson alone or in combination teach or suggest each and every element of the above-noted claims.

1. **Jacobson does not teach or suggest, *inter alia*, “a curved section” or “set screws ... disposed in the apertures” as recited in independent claim 36.**

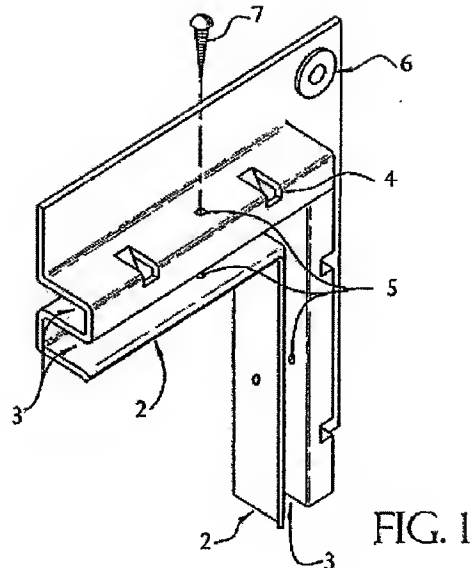
Independent claim 36 recites the following limitation:

wherein the tubular outer portion includes a curved section comprising apertures, and wherein set screws are disposed in the apertures

Similar to independent claim 15, independent claim 36 comprises the limitation “wherein the tubular outer portion includes a curved section comprising apertures, and wherein set screws are disposed in the apertures.” The Office Action admits that neither van Vliet nor Shea nor Williams¹ teach or suggest this limitation. Office Action, page 8. To supply this missing limitation and reject independent claim 36, the Examiner relies on Williams. Specifically, the Examiner alleges on page 8, that Williams, column 2, lines 30-33, disclose a slip collar with “apertures on a curved section.” Appellants respectfully submit that none of the Figures cited by the final Office Action teaches or suggests the above limitation.

The passage of Jacobson cited by the Examiner states: “In a further embodiment, one or more holes are located in the channels in order to accommodate a screw or similar securing means to provide additional strength once the duct work is assembled.” Nowhere in the above passage is there a “curved section comprising apertures” and “set screws ... disposed in the apertures.” Rather, Jacobson provides: “The device comprises a corner member having two legs disposed at **approximately right angles**, each of said legs having oppositely facing and substantially parallel adjacent channels disposed therein to accommodate portions of opposed edges of adjacent segments of duct work.” Jacobson, Abstract (emphasis added). The right angled devices of Jacobson are not “curved sections,” as recited in claim 36. In fact, every embodiment shown in the figures of Jacobson shows “corner members...disposed at approximately right angles.” For example, Figure 1 is reproduced below and, as can be seen, the “holes 5” are not in a “curved section,” as recited in claim 36. *See also* Figs. 4, 5, 6, and 8.

¹ This is inconsistent with the Office Action’s rejection of independent claim 15, which erroneously asserts that Williams discloses a “curved section including apertures.”



2. Neither Williams nor Jacobson teach or suggest, *inter alia*, “wherein the set screws contact the first end section of the duct,” as recited in independent claim 36.

Independent claim 36 recites the following limitation:

a duct comprising a first end section, wherein the first end section of the duct is inserted into the slot region ... wherein the set screws contact the first end section of the duct to secure the first end section of the duct to the slip collar

The Office Action admits that neither van Vliet nor Shea teach or suggest this limitation. Office Action, pages 7-8. To supply this missing limitation and reject independent claim 36, the Examiner appears to rely on Jacobson. Appellants respectfully submit that none of the Figures cited by the final Office Action teaches or suggests the above limitation.

The Examiner alleges at page 7 that Jacobson “teach that slip collars comprise apertures on a curved section and wherein set screws are disposed in the apertures to provide additional strength once the duct work is assembled. (c. 2, l. 30-34).” The Examiner cites column 2, lines 30-34 of Jacobson as teaching “slip collars comprise apertures on a curved section and wherein set screws are disposed in the apertures to provide additional strength once the duct work is assembled.” However, the passage cited by the Examiner states “[i]n a further

embodiment, one or more holes are located in the channels in order to accommodate a screw or similar securing means to provide additional strength once the duct work is assembled.”

Nowhere in the cited passage or anywhere else in the specification of Jacobson is there a description of “set screws” that “contact the first end section of the duct to secure the first end section of the duct to the slip collar.” Indeed, as can be seen in Figure 1 of Jacobson (reproduced above), “screws 7” are not “set screws,” as recited in claim 36. Additionally, one would not have modified Jacobson with set screws because, as can be clearly seen, “screws 7” are intended to be inserted into “holes 5” and screw into (and thereby pierce) the duct. The piercing of the duct, shown in Jacobson, would render the duct system useless for its intended purpose of providing leak-proof vapor ducts. The holes in the duct would comprise the exhaust system. If a proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification. *In re Gordon*, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984). MPEP 2143.01. As such, the prior art invention being modified in a manner that is unsatisfactory for its intended purpose and the obviousness rejection is improper for yet another reason.

3. Declarations providing evidence that the claimed invention is not obvious.

As described in detail above (*supra*, section 7.A.2.), Applicants have submitted additional evidence of non-obviousness in the form of previously filed 37 C.F.R. 1.132 declarations (the First Shea Declaration, the Second Shea Declaration, and the Plecnik Declaration). Therefore, even assuming, *arguendo*, that the Examiner can allege that the claims are obvious in view of the cited references, Applicants submit that the Declarations provide sufficient evidence to rebut any allegation of obviousness because they provide evidence of (1) commercial success; (2) non-obvious advantages over the prior art, and (3) long felt need for the claimed invention.

4. Improper hindsight

For all the reasons discussed above with respect to claim 15, Examiner’s rejection of claim 36 relies on improper hindsight. In addition to failing to teach or suggest all the claim

limitations, the obviousness rejection of claim must combine no less than four references (van Vliet, Shea, Williams, and Jacobson) to reject the invention of even the broadest claim.

Applicants submit that the rejections of record are erroneous and rely on improper hindsight. See *KSR International Co. v. Teleflex Inc.*: 82 USPQ2d 1385 (2007) (“A factfinder should be aware, of course, of the distortion caused by hindsight bias and must be cautious of arguments reliant upon ex post reasoning.”).

Combining these four references in the sequence of events, described above, is illogical and would not have been “obvious” to a person of skill in the art at the time of the invention by looking only at van Vliet, Shea, Williams, and Jacobson, without looking at Applicants’ disclosure. Rather, the proposed sequence of events could have only resulted from improper hindsight in view of Applicants’ disclosure, picking and choosing isolated disclosures from the prior art to meet the claims without regard to what the prior art actually teaches or suggests.

D. Dependent claims 40 and 45

At page 9 of the Office Action, claim 40 is rejected over the combination of van Vliet, Shea, Williams, Jacobson, and Nishio (US 6,045,164). At page 10 of the Office Action, claim 45 is rejected over the combination of van Vliet, Shea, Williams, Jacobson, and Narukawa (US 4,533,020).

Each rejection depends on the improper combination of van Vliet, Shea, Williams, and Jacobson. As noted above, this combination is deficient and the additional citations of Nishio and Narukawa fail to remedy the improper combination. Further, Applicants submit that the combination of at least three and four references to reject the broadest independent claims, and the use of five references to reject dependent claims 40 and 45 is an indication that improper hindsight was used to reject the present claims. It is well known that “[one] cannot use hindsight reconstruction to pick and choose among isolated disclosures in the prior art to deprecate the claimed invention.”) (quoting *In re Fine*, 837 F.2d 1071, 1075 (Fed. Cir. 1988)).

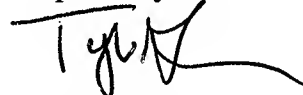
- E. Dependent claim 61: None of the cited references, alone or in combination, teach or suggest that the “apertures are only in the curved section,” as recited in claim 61.**

Nothing in van Vliet, Williams or Shea teaches or suggests that “the apertures are only in the curved section.” According to column 7, lines 39-44 of Williams, “Clamp portions 22 and 24 are connected by a bolt 50 passing through each hole 38 in the flanges 34A, 36A and 34B, 36B.” As admitted by the Examiner, the “flange” of Williams is flat and there are no apertures in the curved section of the collar described in Williams. See Office Action at 12 (stating that the “screws are in apertures that are present in flat flanges.”).

8. CONCLUSION

For these reasons, it is respectfully submitted that the rejection should be reversed.

Respectfully submitted,



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9. CLAIMS APPENDIX

Claims 1.-14. (canceled).

Claim 15. (previously presented) A duct assembly comprising:

- (a) a slip collar comprising (i) a tubular outer wall portion, (ii) a tubular inner wall portion, (iii) an intermediate portion disposed between the tubular outer wall portion and the tubular inner wall portion, (iv) a first slot region defined by the tubular outer wall portion and the tubular inner wall portion, and (v) a second slot region defined by the tubular outer wall portion and the tubular inner wall portion, wherein each of the tubular outer wall portion, the tubular inner wall portion, and the intermediate portion comprises a fiber reinforced plastic material, and wherein the first and second slot regions face away from each other, and wherein the slip collar is an integral, one-piece structure, and wherein the tubular wall outer portion includes a curved section including apertures, and wherein set screws are disposed in the apertures;
- (b) a first duct including a first end inserted into the first slot region; and
- (c) a second duct including a second end inserted into the second slot region, wherein the first end inserted into the first slot region and the second end inserted into the second slot region each have a constant diameter, and wherein the first and second ducts also comprise a fiber reinforced plastic material.

Claims 16.-27. (canceled).

Claim 28. (previously presented) The duct assembly of claim 15 wherein the tubular inner wall portion comprises a chemically resistant material and the tubular outer wall portion comprises a fire-resistant material.

Claims 29.-30. (canceled).

Claim 31. (previously presented) The duct assembly of claim 15 wherein a thickness of the outer wall portion is between about 3/16-inch to about 1-1/2 inches.

Claim 32. (previously presented) The duct assembly of claim 15 further comprising a first adhesive composition in the first slot region and a second adhesive composition in the second slot region, and wherein a thickness of the outer wall portion is between about 3/16-inch to about 1-1/2 inches.

Claim 33. (previously presented) The duct assembly of claim 32 wherein the inner wall portion and the outer wall portion comprise different polymeric materials.

Claim 34. (previously presented) The duct assembly of claim 32 wherein the inner wall portion and the outer wall portion comprise different materials, and wherein the slip collar is free of metal.

Claim 35. (canceled).

Claim 36. (previously presented) A duct assembly comprising:

a slip collar comprising (i) a tubular outer wall portion, (ii) a tubular inner wall portion, (iii) an intermediate portion disposed between the tubular outer wall portion and the tubular inner wall portion, (iv) a slot region defined by the tubular outer wall portion and the tubular inner wall portion, wherein the tubular outer wall portion, the tubular inner wall portion, and the intermediate portion all comprise a fiber reinforced plastic material, and form an integral one-piece structure, and wherein the tubular outer portion includes a curved section comprising apertures, and wherein set screws are disposed in the apertures; and

a duct comprising a first end section, wherein the first end section of the duct is inserted into the slot region, and wherein the first end section has a constant diameter, wherein the set screws contact the first end section of the duct to secure the first end section of the duct to the slip collar, and wherein the duct comprises a fiber reinforced plastic material.

Claim 37. (previously presented) The duct assembly of claim 36 wherein the tubular inner wall portion comprises a chemically resistant material and the tubular outer wall portion comprises a fire-resistant material.

Claim 38. (previously presented) The duct assembly of claim 36 wherein the slip collar has only one slot region.

Claim 39. (previously presented) The duct assembly of claim 36 wherein the tubular inner wall portion is shorter than the tubular outer wall portion.

Claim 40. (previously presented) The duct assembly of claim 36 wherein the tubular inner wall portion comprises a fluoropolymer material.

Claim 41. (previously presented) The duct assembly of claim 36 wherein the inner wall portion comprises a cured vinyl ester resin and the outer wall portion comprises a cured phenolic resin.

Claim 42. (previously presented) The duct assembly of claim 36 further comprising an adhesive composition in the slot region.

Claim 43. (previously presented) The duct assembly of claim 42 wherein the adhesive composition comprises a novalac or an epoxy resin.

Claim 44. (previously presented) The duct assembly of claim 36 wherein the slip collar is free of a metal.

Claim 45. (previously presented) The duct assembly of claim 36 wherein the fiber reinforced plastic material comprises chopped strand mat.

Claim 46. (previously presented) The duct assembly of claim 36 wherein the slip collar is formed first, and after the slip collar is formed, the first end of the duct is inserted into the slot.

Claim 47. (previously presented) The duct assembly of claim 15 wherein the slip collar is formed first, and wherein after the slip collar is formed, the first end of the first duct is inserted into the first slot region and the second end of the second duct is inserted into the second slot region.

Claim 48. (previously presented) The duct assembly of claim 15 wherein the slip collar is formed by a process comprising the steps of:

- applying a first mixture of resin and fabric material around a mandrel to form the tubular inner wall portion;

- positioning at least two spacer elements separated by a gap around the tubular inner wall portion;

- applying a second mixture of resin and fabric material around the tubular inner wall portion within the gap to form the intermediate portion;

- applying a third mixture of resin and fabric material around the intermediate portion and the spacer elements to form the tubular outer wall portion;

- cutting the tubular inner wall portion, the intermediate portion, the spacers and the tubular outer wall portion;

- removing the tubular inner wall portion, the intermediate portion, the spacer elements and the tubular outer wall portion from the mandrel; and,

- removing the spacers.

Claim 49.(previously presented) The duct assembly of claim 48 wherein the first, second and third mixtures of resin and fabric are substantially identical.

Claim 50. (previously presented) The duct assembly of claim 48 wherein the first and second mixtures of resin and fabric are substantially identical.

Claim 51. (previously presented) The duct assembly of claim 48 wherein the second and third mixtures of resin and fabric are substantially identical.

Claim 52. (previously presented) The duct assembly of claim 36 wherein the interior surface of the tubular outer wall portion and the surface of the tubular inner wall surface facing the slot region are smooth.

Claim 53. (previously presented) The duct assembly of claim 15 wherein the fiber reinforced plastic material is impregnated with fibers made of a material selected from the group consisting of graphite, carbon and ceramic.

Claim 54. (previously presented) The duct assembly of claim 15 wherein the slip collar is curved.

Claim 55.-56. (canceled)

Claim 57. (previously presented) The duct assembly of claim 36 further comprising an adhesive between the slip collar and the duct, and around the set screws.

Claim 58. (previously presented) The duct assembly of claim 15 further comprising an adhesive between the slip collar and the first duct, and around the set screws.

Claim 59. (previously presented) The duct assembly of claim 36 , wherein thickness of the inner wall portion is between about 1/10-inch to about 2/10 inch.

Claim 60. (previously presented) The duct assembly of claim 36, wherein the apertures are positioned in pairs comprising a first aperture and a second aperture for each pair, wherein the first aperture of each pair is located on a side opposite of the outer wall portion as the second aperture of each pair.

Claim 61. (previously presented) The duct assembly of claim 15 wherein the apertures are only in the curved section.

Claim 62. (canceled).

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10. EVIDENCE APPENDIX

None.

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11. RELATED PROCEEDINGS APPENDIX

None.